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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1 53(b))

Attorney Docket	03150- P0001A
First Inventor or Application Identifier	Cory Attra, *et al.*
Title	System For Automating And Improving Home Design And Construction
Express Mail Label No.	EM387358097US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: **Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231**

1. [X] Fee Transmittal Form *(e.g., PTO/SB/17)* *(Submit an original, and a duplicate for fee processing)*
2. [X] Specification [Total Pages 37] *(preferred arrangement set forth below)*
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claims(s)
   - Abstract of the Disclosure
3. [X] Drawings(s) *(35 USC 113)* [Total Sheets 10]
4. Oath or Declaration [Total Pages 2]
   - a [X] New executed (original or copy)
   - b [ ] Copy from prior application (37 CFR 1.63(d)) *(for continuation/divisional with Box 16 completed)*
     - i [ ] DELETION OF INVENTOR(S) Signed statement attached deleting Inventors(s) named in the prior application, see 37 CFR a 63(d)(2) and 1 33(b)

5. [ ] Microfiche Computer Program *(Appendix)*
6. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   - a. [ ] Computer Readable Copy
   - b. [ ] Paper Copy (identical to computer copy)
   - c [ ] Statement verifying identity of above copies

NOTE FOR ITEMS 1 & 4D: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 CFR 3.73(b) Statement [X] Power of Attorney (where there is an assignee)
9. [ ] English Translation Document *(if applicable)*
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
13. [X] * Small Entity Statement(s) *(PTO/SB/09-12)* [ ] Statement filed in prior application Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
15. [ ] Other. ... .

16. **If a CONTINUING APPLICATION**, check appropriate box and supply the requisite information
[ ] Continuation [ ] Divisional [ ] Continuation-in-part of prior application No..

Prior application information. Examiner Group/Art Unit

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

18. CORRESPONDENCE ADDRESS

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Signature	Todd M Oberdick			Date	2/3/00

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JC377 U.S. PTO 02/03/00
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PATENT
03150-P0001A WWW/TMO

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	Cory Attra, *et al.*
Serial No. - pending	Filed concurrently herewith
Title of Application:	System For Automating And Improving Home Design And Construction

Assistant Commissioner for Patents
Washington, DC 20231

Verified Statement Claiming Small Entity Status -- Independent Inventors

As below named inventors, the undersigned declares that we qualify as independent inventors as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled **System For Automating And Improving Home Design And Construction** described in the specification filed herewith.

We have not assigned, granted, conveyed, or licensed and are under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which we have assigned, granted, conveyed, or licensed or are under an obligation under contract or law to assign, grant, convey, or license any right in the invention is listed below:

There is no such person, concern, or organization.

We acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

JANUARY 27, 2000
Date

Cory Attra
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Jan 30/00
Date

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09/896,754 062705.P010

PATENT
03150-P0001A WWW/TMO

UNITED STATES PATENT APPLICATION

of

Cory Attra
17 Lords Highway
Weston, CT 06883

and

Marc Pritchard
4738 Cache Peak Drive
Antioch, CA 94509

for

SYSTEM FOR AUTOMATING AND IMPROVING HOME DESIGN AND CONSTRUCTION

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February 3, 2000

Fidelia K. Rice

SYSTEM FOR AUTOMATING AND IMPROVING HOME DESIGN AND CONSTRUCTION

Field of the Invention

The present invention relates to a system which automates and improves home design and construction, and more particularly to an automated web-based system which reduces the time and cost required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce documents and information essential for, the construction, remodeling, repair or reconstruction of a home.

Background of the Invention

The conventional process by which the general public currently builds, remodels, repairs or reconstructs a home involves a sequence of logically related activities engaging the advice and assistance of various professional and technical experts such as consultants, designers, builders, developers, and realtors. There are many permutations to a common theme. Generally, these processes can be summarized in terms of five major events.

Conceptualize. The first step is to conceive a physical feature or aspect of a home that would satisfy one or more existing or future needs. For example, an avid swimmer might learn through casual conversation that it costs less to build a swimming pool than to join a private country club, or that it costs less to build a pool

than he/she might have otherwise imagined. In either case, the person has conceptualized a swimming pool for his/her home.

Plan and Program. Planning has two parts. Part one is a process by which the feasibility of a person's concept is analyzed and determined. For example, a person might conceive the need for a swimming pool but, after close examination with a pool contractor, determine that the cost could be prohibitively higher than expected if the project involves blasting. Part two of planning is the process of determining the general activities, time frames, and approximate costs for potentially feasible concepts. Programming is the process of assigning these costs to activities and time frames associated with implementing the concept, thus calculating various financial scenarios.

Inventory and Categorize Supply. Under conventional practices, it is necessary to develop sufficient information about a plan in order to solicit and procure the services of professional designers, developers, and builders. The amount of information contained in the scope of work varies depending on how these services are to be packaged, but generally, it contains enough information with which a party can make a contractual offer. For example, the scope of work for a planned swimming pool might contain the location of the property, goal for the budget, and a listing of associated amenities such as a pool house and spa.

Design. A designer works with a homeowner to develop the planned concept into detailed drawings and specifications used to physically construct the planned

concept in accordance with state and local codes. There are many processes used to design homes but the essence of home design is an iterative process that starts with a designer identifying the needs from which a concept was created. The designer then translates this information into plan drawings that theoretically satisfy the needs. The person studies the plans, perhaps engaging other family members or friends, and provides feedback to the designer. The designer then modifies the plans whereupon the person then studies the modified plans and so on. The process continues until the person is satisfied that the design meets his/her needs. With homes, the design process can be time consuming and costly because the designer is usually compelled to satisfy a wide and diverse range of needs.

Budget and Aggregate Prices. A designer normally calculates a plan budget, aggregating prices, with every iteration of the design process. This is normally done using one of two methods: (1) calculating aggregate cost estimates based on the designer's historical data such as price per square foot for garage; or (2) compiling detailed cost estimates using the drawings, specifications, and published data.

The financing of a home plan from a bank requires a "bankable" cost estimate. These can be generated in two ways: (1) soliciting and obtaining firm bid prices from builders and construction contractors based on design documents; or (2) compiling detailed cost estimates from professional cost estimators guaranteeing calculations.

Thus, remodeling, repairing or reconstructing a home has traditionally involved a sequence of logically related activities engaging the advice and assistance of various professional and technical experts such as consultants. Such an approach, with its repetitive revisions and recalculations, is time consuming and can be quite expensive. For example, the homeowner may desire numerous estimates to determine which various amenities to include in a home, which building materials to have used, etc. In such a case, the designer would have to perform numerous recalculations, for which the homeowner would have to pay.

What is desired, therefore, is a system which reduces the time and cost required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce documents and information essential for, the construction, remodeling, repair or reconstruction of a home, which automates much of the labor required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce documents and information essential for, the construction, remodeling, repair or reconstruction of a home, which allows homeowners to research and interact with consultants, designers, builders and contractors of homes, and which provides for automated and efficient management of the construction, remodeling, repair or reconstruction of a home.

Summary of the Invention

Accordingly, it is an object of the present invention to provide a system which reduces the time and cost required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce

documents and information essential for, the construction, remodeling, repair or reconstruction of a home.

Another object of the present invention is to provide a system having the above characteristics and which automates much of the labor required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce documents and information essential for, the construction, remodeling, repair or reconstruction of a home.

A further object of the present invention is to provide a system having the above characteristics and which allows the general public to research, learn about, analyze, evaluate, interview, select, and purchase the services of consultants, designers, builders, and contractors of homes.

Still another object of the present invention is to provide a system having the above characteristics and which allows homeowners and insurance carriers of homes to reduce the amount of time and cost required to repair or reconstruct a home that is damaged or destroyed.

Yet a further object of the present invention is to provide a system having the above characteristics and which provides for automated and efficient management of the construction, remodeling, repair or reconstruction of a home.

These and other objects of the present invention are achieved by provision of a system for providing construction services which includes a computer having software executing thereon for transmitting queries and for receiving responses to the transmitted queries. The system also includes software executing on the computer for generating a home plan based on the received responses to the transmitted queries and for performing work package calculations on the home plan to generate a breakdown. Software executing on the computer displays details of the home plan, receives requests for modification of the details of the home plan, and generates a modified home plan based upon the received requests for modification. The software executing on the computer then performs work package calculations on the modified home plan to generate a modified breakdown.

In one embodiment, the system includes a database having a plurality of home plans stored thereon, and the software executing on the computer for generating a home plan retrieves one of the plurality of home plans stored on the database based on the responses to the transmitted queries. In another embodiment, the software executing on the computer for generating a home plan generates a scope summary based on the received responses to the transmitted queries and generates a home plan based on the scope summary. The queries may relate to a homeowner's lifestyle and fundamental needs, in which case the scope summary comprises a homeowner profile, or the queries may relate to required details of the home plan, in which case the scope summary comprises a home specification.

The system includes software executing on the computer for receiving information necessary to prepare a bankable estimate, and for using the received information and the breakdown to generate and transmit a bankable estimate. In addition, the system includes software executing on the computer for receiving information necessary to prepare an offer, for generating contract documents using the received information, and for using the contract documents and the breakdown to generate and transmit an offer. Preferably, the system also includes software executing on the computer for generating and transmitting offers to goods and services providers for supplies needed and work to be performed, for receiving acceptances of the offers to goods and services providers, and for generating a ratification of a purchase order for each of the offers to goods and service providers for which acceptances are received and for opening a bidding process for each of the offers to goods and service providers for which acceptances are not received.

The system includes software executing on the computer for generating a construction plan, which has a plurality of construction steps and an indication of construction progress, whether each of the steps is ready to occur being dependent on construction progress. The generated construction plan is stored on a construction plan database. The system includes software executing on the computer for periodically examining the construction plan stored on the database, for determining if at least one of the construction steps is ready to occur based upon the indication of construction progress, and for generating and transmitting a notification to goods and services providers if at least one of the construction steps is ready to occur. Software executing on the computer is provided for receiving indications from goods and

services providers of changes in the construction progress and for updating the construction plan stored on the database based upon the received indications of changes in construction progress.

Preferably, the system includes a website for retrieving and displaying the home plan stored on the database. The website is accessible by a homeowner, thereby allowing the homeowner to view the home plan and the construction progress at any given time. Most preferably, the system includes a video input device located at the construction site. The video input device transmits images of the construction site to the website so the homeowner can view construction progress.

The invention and its particular features and advantages will become more apparent from the following detailed description considered with reference to the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is a block diagram of a system for providing construction services in accordance with the present invention;

Fig. 2 is a block diagram of a query routine portion of the system for providing construction services of FIG. 1;

Fig. 3 is a block diagram of a portion of the query routine software of FIG. 2 illustrating the selection of a plan from a database of plans;

Fig. 4 is a block diagram of a portion of the query routine software of FIG. 2 illustrating the generation of a home plan using query-based models;

Fig. 5 is a block diagram of a calculation routine portion of the system for providing construction services of FIG. 1;

Fig. 6 is a block diagram of a portion of the system for providing construction services of FIG. 1 illustrating generation of a written offer and an offer process for goods and services providers;

Fig. 7 is a block diagram of a portion of the system for providing construction services of FIG. 1 illustrating generation of a bankable estimate and a guaranteed maximum price;

Fig. 8 is a block diagram of a portion of the system for providing construction services of FIG. 1 illustrating a construction management aspect of the system;

Fig. 9 is a block diagram of a property selection routine which may be incorporated into the system for providing construction services of FIG. 1; and

Fig. 10 is a block diagram of an embodiment of the system for providing construction services of FIG. 1 incorporating security provisions to protect proprietary software.

Detailed Description of the Invention

Referring first to FIG. 1, a system **10** for providing construction services in accordance with the present invention is shown in its simplest form. System **10** includes a system computer **12**, having query routine software **14** and calculation routine software **16** executing thereon. System **10** may also include one or more databases **18** which may be used by system **10** as described fully below.

Query routine software **14** generates queries **20** pertinent to the design of a home and transmits queries **20** through an internet communication link **22** to a user computer **24**. A user operating user computer **24** then views queries **20**, composes responses **26** to queries **20**, and transmits responses **26** to system computer **12** through internet communication link **22**. Calculation routine software **16** uses query responses **26** to calculate a home plan, perform work package calculations to generate a breakdown based on the home plan, and generate various other pertinent documents, such as a bankable estimate and an offer to build. These documents **28** are transmitted back to user computer **24** through internet communication link **22**.

It should be understood that by "work package calculations," what is meant is software that categorizes and inventories supply and aggregate prices, and produces comprehensive breakdowns of all components to design and construction using a limited number of input variables.

In most cases the user operating user computer **24** will be a prospective homeowner desiring to have a home designed and constructed. However, it should be understood that others may also use system **10**. For example, insurance carriers may use system **10** to catalog and aggregate prices for home construction work, and can obtain guarantees from system **10** toward these prices.

Referring now to FIG. 2, operation of query routine software **14** is shown in more detail. Query routine software **14** gives the user the option of selecting to repair or rebuild a home **30**, remodel an existing home **32**, or build a new home **34**. If the user elects to repair or rebuild a home **30**, query routine software **14** determines whether the user is a subscriber (shown at **36**), that is, whether the user has used system **10** on a paid basis. Plans of homes designed or constructed using system **10** are stored on a subscriber home plans database **38**, which is accessible by query routine software **14**. If the user is a subscriber, query routine software **14** retrieves the home plan **40** for the subscriber's home from subscriber plans database **38** and transmits the retrieved subscriber home plan **40** to calculation routine software **16**.

If the user has elected to repair or rebuild a home **30** and the user is not a subscriber, or if the user has selected to remodel and existing home **32** or build a new home **34**, query routine provides the user with a choice (shown at **42**) to design a home or portions of a home either by using a custom query-based model or by

selecting a pre-made plan. If the user chooses to select a pre-made plan, the user selects a plan (shown at **44**) from a database of stored plans, and the retrieved plan **46** is transmitted to calculation routine software **16**. A more detailed explanation of the selection process is presented below and illustrated in FIG. 3. If the user chooses to use a custom query-based model, query routine software **14** generates a home plan based on user responses to queries (shown at **47**) and transmits the generated home plan **49** to calculation routine **16**. A more detailed explanation of the query-based models is presented below and illustrated in FIG. 4.

Referring now to FIG. 3, when the user chooses to select a pre-made plan, query routine software **14** generates and transmits a series of basic queries **48** to the user, to which the user responds. Basic queries **48** include only the most salient features of a home, for example, the number of square feet, the number of bedrooms, the number of bathrooms, the architectural style, and any required amenities, such as fireplaces, an in-door pool, a sauna, etc. Query routine software **14** compares (shown at **50**) the users responses with a plurality of pre-made home plans stored on a plans database **52** to determine which home plans meet the user's criteria. To this end, each of the home plans stored on database **52** includes an indication of salient features in addition to floor plans and renderings **54** and a summary breakdown **56** of labor, materials, equipment, and costs associated with the home plan. For example, if the user specifies a home having 4750 to 5000 square feet, four or more bedrooms, four or more bathrooms, a Colonial style, three or more fireplaces and a sauna, query routine software will determine which plans

meet all of these criteria. Query routine software **14** then transmits a display of floor plans and renderings **54** and a summary breakdown **56** to the user. If the user is satisfied (indicated at **58**) with the retrieved home plan, the home plan is transmitted to calculation routine **16**. If the user is not satisfied with the home plan, query routine software retrieves and displays additional home plans which match the user's criteria until the user is satisfied.

Referring now to FIG. 4, when the user chooses to a design a custom home using a query-based model, query routine software **14** may use one of two models selectable by the user (shown at **60**), a user profile-based model, or a home specification-based model. When the profile-based model is used, query routine software **14** generates a series of queries **62** based upon the user's lifestyle and personal tastes in a home. Such queries may, for example, relate to the purpose of the home (e.g., retirement home, income generation, vacation home, primary residence), fundamental needs of the family (e.g., age of family members, number of children, number of vehicles), cultural requirements (e.g., worship chamber, special kitchen requirements), business needs (e.g., home office, special electronics or communications), health care needs (e.g., special medical equipment, handicap facilities, air purification), basic architectural style preferences (e.g., Colonial, Tutor, Victorian), social activities (e.g., large parties, formal dinner parties), meal habits (e.g., eat and run, informal family setting, formal setting with servants), children's play habits (e.g., with family or separate room), live-in servants (e.g., au par, butler, maid, grounds keeper), etc. Other queries may relate to amenities and services

which are included in the home (e.g., pool, basketball or tennis court, steam room), or available in the area (e.g., country club, horse trainer, private schools).

Query routine software **14** receives responses (shown at **64**) to queries **62**, and generates a user profile **66**. When the user is finished (shown at **68**) responding to queries **62**, query routine software **14** uses completed user profile **66** to generate at least one home plan (shown at **70**) and detailed cost breakdown incorporating design concepts based upon the lifestyle and personal tastes of the user as reflected in user profile **66**. Preferably, each home plan also includes floor plans and renderings, and query routine software **14** generates multiple home plans and corresponding detailed cost breakdowns, to give the user a choice of home plans from which to select. Query routine software **14** then transmits the generated home plan **72** to calculation routine **16**.

When the specification-based model is used, query routine software **14** generates a series of queries **74** based upon a comprehensive list of features the user requires in a home. Such queries may, for example, relate to the number and types of rooms, the dimensions of each room, building materials, wall and floor finishes of each room, number and types of doors and windows, exterior finish of home, number or car garage, whether garage is detached, and a number of other details. Query routine software **14** receives responses (shown at **76**) to queries **74**, and generates a list of home specifications **78**. When the user is finished (shown at **80**) responding to queries **74**, query routine software **14** uses the completed list of

home specifications **78** to generate a detailed cost breakdown and at least one home plan (shown at **70**) incorporating the requirements listed in home specifications **78**. Query routine software **14** then transmits the generated home plan **72** to calculation routine **16**

The number of queries **62**, **74** which the user is required to answer is minimal. However, it should be understood that the accuracy of the generated home plan **72** is directly proportional to the amount of information provided by the user through queries **62**, **74**. It should also be understood that the accuracy of the calculations performed by calculation routine **16** for queries **62**, **74** are also in some capacity proportional to the number of queries **62**, **74** which the user answers.

Referring now to FIG. 5, operation of calculation routine software **16** is shown in more detail. Calculation routine software **16** receives a home plan **82** from query routine **14**. Home plan **82** will be a subscriber home plan **40** if the user is repairing or rebuilding a home and the user is a subscriber, a retrieved home plan **46** if the user selected a pre-made plan, or a generated home plan **72** if the user designed a custom home using a query-based model. Calculation routine software **16** performs work package calculations (shown at **84**) on the home plan **82** to generate a summary breakdown **86** of labor, material, equipment, and costs associated with the design concept embodied in home plan **82**. If home plan **82** is a subscriber home plan **40**, the summary breakdown will already have been provided to calculation routine software **16**, and work package calculations **84** will not be required. It should

be understood that numerous software-based systems for performing work package calculations are known in the art, and that any one of such systems may be used with system **10**.

Calculation routine software **16** displays summary breakdown **86** to the user, and allows the user to choose from various options (shown at **88**), which may include viewing and revising initial home plan selection **90**, requesting a written offer to build the home **92**, requesting a bankable estimate and breakdown **94**, or displaying the details of the home plan and breakdown **96**. If the user chooses to display the details **96**, calculation routine software **16** transmits the details to the user, and allows the user to make changes (shown at **98**) to the details of the home plan **82**. Such details may include such things as brands of materials to be used, carpet selection, finish of fixtures, and similar details which do not require recalculation of the entire home plan. Calculation routine software **16** receives the user's request to add, subtract or modify details **100**, and modifies (shown at **102**) home plan **82** accordingly. Calculation routine software **16** performs work package calculations (shown at **84**) on the now-modified home plan **82** to generate a revised summary breakdown **86**, and the user is given the same options **88** as discussed above. Thus, calculation routine software **16** allows for comparative shopping, analysis, and research into each component of the breakdown, and allows modification or substitution of each component with other components such that aggregation of prices and calculations automatically occur.

Reference is now made to FIG. 6, which details how an offer is prepared in response to a user's request for a written offer **92** and the offer process for goods and services providers, such as manufacturers, distributors, suppliers, contractors, consultants and designers. When a request for a written offer **92** is received, system **10** requires the user to register detailed information **104** necessary to prepare the offer and contract documents. When this information is received, system **10** generates a notice to the system to prepare an offer **106**. System **10** uses the detailed information **104** supplied by the user and the breakdown **86** to generate a cover letter, contract documents, and other documents required by state law **108**, which are in turn assembled, together with the breakdown **86**, to generate an offer **110**. At this stage, human intervention is required because state law requires that licensed professional designers (e.g. architects and engineers) develop design documents in accordance with state and local codes in order to build a plan. The final product of a design process normally consists of plan drawings and detailed specifications that are approved and stamped by the professional responsible for the design documents. Thus, human intervention is required to execute any documents required by state law, as well as to perform quality control functions (shown at **112**). The offer is then transmitted **114** to the user. If the offer is accepted by the user **116**, system **10** ratifies the agreement **118** which has been formed by the offer and acceptance of the offer.

When system **10** receives the notice to prepare the offer **106**, system **10** also generates a notice to preferred goods and services providers **120** offering contracts

for goods and services that will be required for construction according to the home plan **82**. For the goods and services for which the offers are accepted at **122**, system **10** generates and transmits a notice **124** ratifying the purchase order created by the offer and acceptance. For the goods and services for which the offers are not accepted at **122**, system **10** generates and transmits a notice **126** to a network of goods and services providers offering contracts for the goods and services needed. For the goods and services for which the offers are accepted at **128**, system **10** generates and transmits a notice **130** ratifying the purchase order created by the offer and acceptance. For the goods and services for which the offers are not accepted at **128**, system **10** generates a notice **132** for commencement of an open bidding process to the general market for goods and services that require human intervention.

Reference is now made to FIG. 7, which details how a bankable estimate and guaranteed maximum price are prepared in response to a user's request for a bankable estimate **94**. When a request for a bankable estimate **94** is received, system **10** requires the user to register detailed information **138** necessary to prepare the bankable estimate and guaranteed maximum price. When this information is received, system **10** generates a notice **140** to an employee, typically but not necessarily in the operations department, to prepare a bankable estimate and guaranteed maximum price. The employee confirms the bankable estimate request with the user **142**, and upon confirmation generates a notice **144** to system **10** to prepare the bankable estimate. The employee also will typically generate a

cover letter **146** and other required documents and forward these documents to an employee typically in quality control **148**. As should be obvious, the employee in operations and the employee in quality control **148** may be the same person. Upon receiving the notice **144** to prepare the offer, system **10** uses the detailed information **138** supplied by the user, and the breakdown **86** to prepare an estimate, which is transmitted **150**, along with the breakdown **86**, to quality control **148**. At this point, the employee in quality control **148** prepares the bankable estimate and guaranteed maximum price by assembling the employee-prepared documents with the documents prepared by system **10**, and the bankable estimate, breakdown and guaranteed maximum price are transmitted **152** either by the employee or by system **10** to the user in legal form and in accordance with state law. If the offer for goods and services contained within the bankable estimate is accepted by the user **154**, either the employee or system **10** ratifies the agreement **156** which has been formed by the offer and acceptance of the offer.

Referring now to FIG. 8, a construction management aspect of system **10** is shown. Once an offer to build a home is accepted, system **10** generates a construction plan, which comprises a series of steps which have triggering events dependent on construction progress. For example, one of the steps may call for framing the home, which step cannot be performed until the foundation is completed. Another step may be for carpets to be installed, which step may be dependent upon the completion of interior painting and electrical systems, for example. The construction plan also includes an indication of the current

construction progress, that is, the status of each of the steps (i.e., to what extent each step has been completed). The generated construction plan **158** is stored on a construction plans database **160**, which may also include construction plans for other jobs in progress. System **10** periodically retrieves and examines the construction plan **162** from construction plans database **160** to determine if the job is ready for commencement of the next step **164**. System **10** may perform the examining step **162** at time-based intervals, for example, once a day, or may perform the examining step when a change is made to the indication of construction progress.

If the job is ready for commencement of a step, system **10** generates and transmits a notice **166** to goods and services providers **168** notifying them of such. When goods and services providers **168** have made progress on, or completed, a step, the providers **168** notify system **10** of such changes in construction progress **170**, and system **10** uses such information to update the indication of construction progress portion of the construction plan **172** stored on construction plans database **160**. Thus, when the construction plan is again examined **162**, system **10** may predict that future steps are imminent and notify goods and services providers **168** of planned start dates, aggregation of prices, and the updated indication of construction progress.

System **10** also preferably includes a job status website **174** which is accessible by the user through user computer **24**. Construction plans database **160**

is accessible by job status website **174** so that website **174** can retrieve the construction plan from database **160**, thereby allowing the user to view the construction plan and the indication of construction progress when desired. Thus, the user may always know the status of the job. Preferably, website **174** is also accessible by goods and services providers **168** and allows providers **168** to post information on website **174** so that system **10** allows the user to research, learn about, analyze, evaluate, interview and select goods and services providers both before construction commences and while construction is proceeding. Most preferably, system **10** also includes a video input device **176**, such as a digital camera, located at the construction site which transmits images of the construction site to job status website **174** so that the user and goods and services providers **168** can view the status of the job.

Referring now to FIG. 9, system **10** preferably includes property selection routine software **178** executing on computer **12** for allowing a user to select a property on which to have a house constructed. Property selection routine software **178** generates and transmits a series of queries **180** to the user, to which the user responds. Queries **180** may be directed to the specifications of a lot on which, or of a community in which, the user wishes to construct a home, and may include queries **180** relating to such specifications as the property location, the property size, the property attributes (i.e., beachfront, lakefront, wooded, hills, etc.), services available in the area of the property (i.e., day care, country clubs, private schools, etc.), and other salient information. When such information has already

been provided as part of queries **62**, **74**, the salient information can be extracted therefrom by property routine selection software **178**, and separate queries **180** are not required. Property selection routine software **178** compares (shown at **182**) the users responses with a plurality of properties stored on a properties database **184** accessible by computer **12** to determine which properties meet the user's criteria, and retrieves a description of each matching property. To this end, each of the properties stored on database **184** includes an indication of salient features. Property selection routine software **178** then transmits a legal description **186** and relevant images **188** (i.e., maps of the property, photographs of the property, etc.) of each matching property to the user. If the user is satisfied (indicated at **190**) with the retrieved property, a description of the retrieved property **192** is transmitted to calculation routine **16** to be used in performing work package calculations and detailed breakdowns. If the user is not satisfied with the property, property selection routine software **178** retrieves and displays additional properties which match the user's criteria until the user is satisfied. Preferably, property selection routine software **178** retrieves and transmits legal descriptions **186** and relevant images **188** of multiple properties to give the user a choice of properties from which to select.

Referring now to FIG. 10, an embodiment of the system **10'** of the present invention may incorporate two or more separate computers, instead of one computer **12**. Such may be desirable, for example, when proprietary software and algorithms are used with system **10'**. System **10'** includes a web server **194** accessible to users via the internet or otherwise as described above with respect to computer **12**,

and an application server **196**, which is not connected to the internet. Non-sensitive or non-proprietary software, for example query routine software **14'** and calculation routine software **16'**, may be executing on web server **194**, while proprietary software, for example work package calculation software **84'**, may be executing on application server **196**. Home plans, breakdowns, and other necessary information may be passed between query routine software **14'**, calculation routine software **16'**, and work package calculation software **84'** by storing this information on a database **198** accessible by both web server **194** and application server **196**, which information after being stored by one software program can then be retrieved by another software program. For example, a home plan may be generated by query routine software **14'**, stored on database **198**, and retrieved by work package calculation software **84'**. Work package calculation software may then use the retrieved home plan to generate breakdowns and store the generated breakdowns on database **198**. The stored breakdowns may then be retrieved by calculation routine software **16'** for further processing. In this manner, work package calculation software **84'** remains isolated from the internet, and is therefore not easily accessible by the general public. It should be understood that other programs or portions thereof, may also be executing on application server **196** when such other programs or portions thereof are proprietary.

The present invention, therefore, provides a system which reduces the time and cost required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce documents and information

essential for, the construction, remodeling, repair or reconstruction of a home, which automates much of the labor required to conceive, plan and program, inventory and categorize supply for, design, budget and aggregate prices for, and produce documents and information essential for, the construction, remodeling, repair or reconstruction of a home, which allows homeowners to research and interact with consultants, designers, builders and contractors of homes, and which provides for automated and efficient management of the construction, remodeling, repair or reconstruction of a home.

Although the invention has been described with reference to a particular arrangement of parts, features and the like, these are not intended to exhaust all possible arrangements or features, and indeed many other modifications and variations will be ascertainable to those of skill in the art.

What is claimed is:

1. A system for providing construction services comprising:

a computer;

software executing on said computer for transmitting queries and for receiving responses to the transmitted queries;

software executing on said computer for generating a home plan based on the received responses to the transmitted queries;

software executing on said computer for performing work package calculations on the home plan to generate a breakdown;

software executing on said computer for displaying details of the home plan and for receiving requests for modification of the details of the home plan;

software executing on said computer for generating a modified home plan based upon the received requests for modification; and

software executing on said computer for performing work package calculations on the modified home plan to generate a modified breakdown.

2. The system for providing construction services of Claim 1 further comprising a database having a plurality of home plans stored thereon and wherein the software executing on said computer for generating a home plan comprises:

software executing on said computer for retrieving one of the plurality of home plans stored on said database based on the responses to the transmitted queries.

3. The system for providing construction services of Claim 1 wherein the software executing on said computer for generating a home plan comprises:

software executing on said computer for generating a scope summary based on the received responses to the transmitted queries; and

software executing on said computer for generating a home plan based on the scope summary.

4. The system for providing construction services of Claim 3 wherein the queries comprise queries relating to a user's lifestyle and fundamental needs and wherein the scope summary comprises a user profile from which the system generates a home plan.

5. The system for providing construction services of Claim 3 wherein the queries comprise queries relating to required details of the home plan and wherein the scope summary comprises a home specification.

6. The system for providing construction services of Claim 1 further comprising:

software executing on said computer for receiving information necessary to prepare an offer;

software executing on said computer for generating contract documents using the received information; and

software executing on said computer for using the contract documents and the breakdown to generate and transmit an offer.

7. The system for providing construction services of Claim 6 further comprising:

software executing on said computer for generating and transmitting offers to goods and services providers for supplies needed and work to be performed;

software executing on said computer for receiving acceptances of the offers to goods and services providers; and

software executing on said computer for generating a ratification of a purchase order for each of the offers to goods and service providers for which acceptances are received and for opening a bidding process for each of the offers to goods and service providers for which acceptances are not received.

8. The system for providing construction services of Claim 1 further comprising:

software executing on said computer for receiving information necessary to prepare a bankable estimate; and

software executing on said computer for using the received information and the breakdown to generate and transmit a bankable estimate.

9. The system for providing construction services of Claim 1 further comprising:

software executing on said computer for generating a construction plan, the construction plan having a plurality of construction steps and an indication of construction progress, whether each of the steps is ready to occur being dependent on construction progress;

a construction plan database having the generated construction plan stored thereon;

software executing on said computer for periodically examining the construction plan stored on said database, for determining if at least one of the construction steps is ready to occur based upon the indication of construction progress, and for generating and transmitting a notification to goods and services providers if at least one of the construction steps is ready to occur; and

software executing on said computer for receiving indications from goods and services providers of changes in the construction progress and for updating the construction plan stored on said database based upon the received indications of changes in construction progress.

10. The system for providing construction services of Claim 9 further comprising a website for retrieving and displaying the home plan stored on said database, said website accessible by a user, thereby allowing the user to view the home plan and the construction progress.

11. The system for providing construction services of Claim 10 wherein the construction steps take place at a construction site and further comprising a video input device located at the construction site, said video input device transmitting images of the construction site to said website.

12. A system for providing construction services comprising:

a computer;

software executing on said computer for transmitting queries and for receiving responses to the transmitted queries;

a database having a plurality of home plans stored thereon; and

software executing on said computer for retrieving one of said plurality of home plans stored on said database based on the responses to the transmitted queries.

13. The system for providing construction services of Claim 12 further comprising

software executing on said computer for performing work package calculations on the home plan to generate a breakdown;

software executing on said computer for displaying details of the home plan and for receiving requests for modification of the details of the home plan;

software executing on said computer for generating a modified home plan based upon the received requests for modification; and

software executing on said computer for performing work package calculations on the modified home plan to generate a modified breakdown.

14. The system for providing construction services of Claim 13 further comprising:

software executing on said computer for receiving information necessary to prepare an offer;

software executing on said computer for generating contract documents using the received information; and

software executing on said computer for using the contract documents and the breakdown to generate and transmit an offer.

15. The system for providing construction services of Claim 14 further comprising:

software executing on said computer for generating and transmitting offers to goods and services providers for supplies needed and work to be performed;

software executing on said computer for receiving acceptances of the offers to goods and services providers; and

software executing on said computer for generating a ratification of a purchase order for each of the offers to goods and service providers for which acceptances are received and for opening a bidding process for each of the offers to goods and service providers for which acceptances are not received.

16. The system for providing construction services of Claim 13 further comprising:

software executing on said computer for receiving information necessary to prepare a bankable estimate; and

software executing on said computer for using the received information and the breakdown to generate and transmit a bankable estimate.

17. The system for providing construction services of Claim 12 further comprising:

software executing on said computer for generating a construction plan, the construction plan having a plurality of construction steps and an indication of construction progress, whether each of the steps is ready to occur being dependent on construction progress;

a construction plan database having the generated construction plan stored thereon;

software executing on said computer for periodically examining the construction plan stored on said database, for determining if at least one of the construction steps is ready to occur based upon the indication of construction progress, and for generating and transmitting a notification to goods and services providers if at least one of the construction steps is ready to occur; and

software executing on said computer for receiving indications from goods and services providers of changes in the construction progress and for updating the construction plan stored on said database based upon the received indications of changes in construction progress.

18. The system for providing construction services of Claim 17 further comprising a website for retrieving and displaying the home plan stored on said database, said website accessible by a user, thereby allowing the user to view the home plan and the construction progress.

19. The system for providing construction services of Claim 18 wherein the construction steps take place at a construction site and further comprising a video input device located at the construction site, said video input device transmitting images of the construction site to said website.

20. A system for providing construction services comprising:

a computer;

software executing on said computer for generating a construction plan, the construction plan having a plurality of construction steps and an indication of

construction progress, whether each of the steps is ready to occur being dependent on construction progress;

a construction plan database having the generated construction plan stored thereon;

software executing on said computer for periodically examining the construction plan stored on said database, for determining if at least one of the construction steps is ready to occur based upon the indication of construction progress, and for generating and transmitting a notification to goods and services providers if at least one of the construction steps is ready to occur; and

software executing on said computer for receiving indications from goods and services providers of changes in the construction progress and for updating the construction plan stored on said database based upon the received indications of changes in construction progress.

21. The system for providing construction services of Claim 20 further comprising a website for retrieving and displaying the home plan stored on said database, said website accessible by a user, thereby allowing the user to view the home plan and the construction progress.

22. The system for providing construction services of Claim 21 wherein the construction steps take place at a construction site and further comprising a video input device located at the construction site, said video input device transmitting images of the construction site to said website.

23. A system for facilitating the repairing and rebuilding comprising:

a computer;

a database having stored thereon a plurality of subscriber home plans accessible by a value attributed to a subscriber identification;

software executing on said computer for receiving a subscriber identification and for retrieving from said database a home plan corresponding to the value attributed to the received subscriber identification;

software executing on said computer for performing work package calculations on the home plan to generate a breakdown;

software executing on said computer for displaying details of the home plan and for receiving requests for modification of the details of the home plan;

software executing on said computer for generating a modified home plan based upon the received requests for modification; and

software executing on said computer for performing work package calculations on the modified home plan to generate a modified breakdown.

24. The system for providing construction services of Claim 23 further comprising:

software executing on said computer for receiving information necessary to prepare an offer;

software executing on said computer for generating contract documents using the received information; and

software executing on said computer for using the contract documents and the breakdown to generate and transmit an offer.

25. The system for providing construction services of Claim 24 further comprising:

software executing on said computer for generating and transmitting offers to goods and services providers for supplies needed and work to be performed;

software executing on said computer for receiving acceptances of the offers to goods and services providers; and

software executing on said computer for generating a ratification of a purchase order for each of the offers to goods and service providers for which acceptances are received and for opening a bidding process for each of the offers to goods and service providers for which acceptances are not received.

26. The system for providing construction services of Claim 23 further comprising:

software executing on said computer for receiving information necessary to prepare a bankable estimate; and

software executing on said computer for using the received information and the breakdown to generate and transmit a bankable estimate.

SYSTEM FOR AUTOMATING AND IMPROVING HOME DESIGN AND CONSTRUCTION

Abstract of the Disclosure

A system for providing construction services is provided. The system includes a system computer having query routine software and calculation routine software executing thereon. Query routine software generates queries pertinent to the design of a home and transmits the queries through an internet communication link to a user computer. A user operating the user computer then views the queries, composes responses to the queries, and transmits the responses to the system computer through the internet communication link. Calculation routine software uses the query responses to calculate a home plan, perform work package calculations to generate a breakdown based on the home plan, and generate various other pertinent documents, such as a bankable estimate and an offer to build. These documents are transmitted back to the user computer through the internet communication link.

PATENT
03150-P0001A WWW/TMO

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	Cory Attra, et al.
Serial No. - pending	Filing Date: February 3, 2000
Title of Application:	System For Automating And Improving Home Design And Construction

Box Patent Application
Assistant Commissioner for Patents
Washington, DC 20231

Cover Sheet For Ten Sheets Of Drawings

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Express Mail Certificate: I hereby certify that this correspondence is today being deposited with the U.S. Postal Service as *Express Mail Post Office to Addressee* Mailing Label Number EM387358097US in an envelope addressed to: Box Patent Application, Assistant Commissioner for Patents, Washington, DC 20231.

February 3, 2000

Fidelia K. Rice

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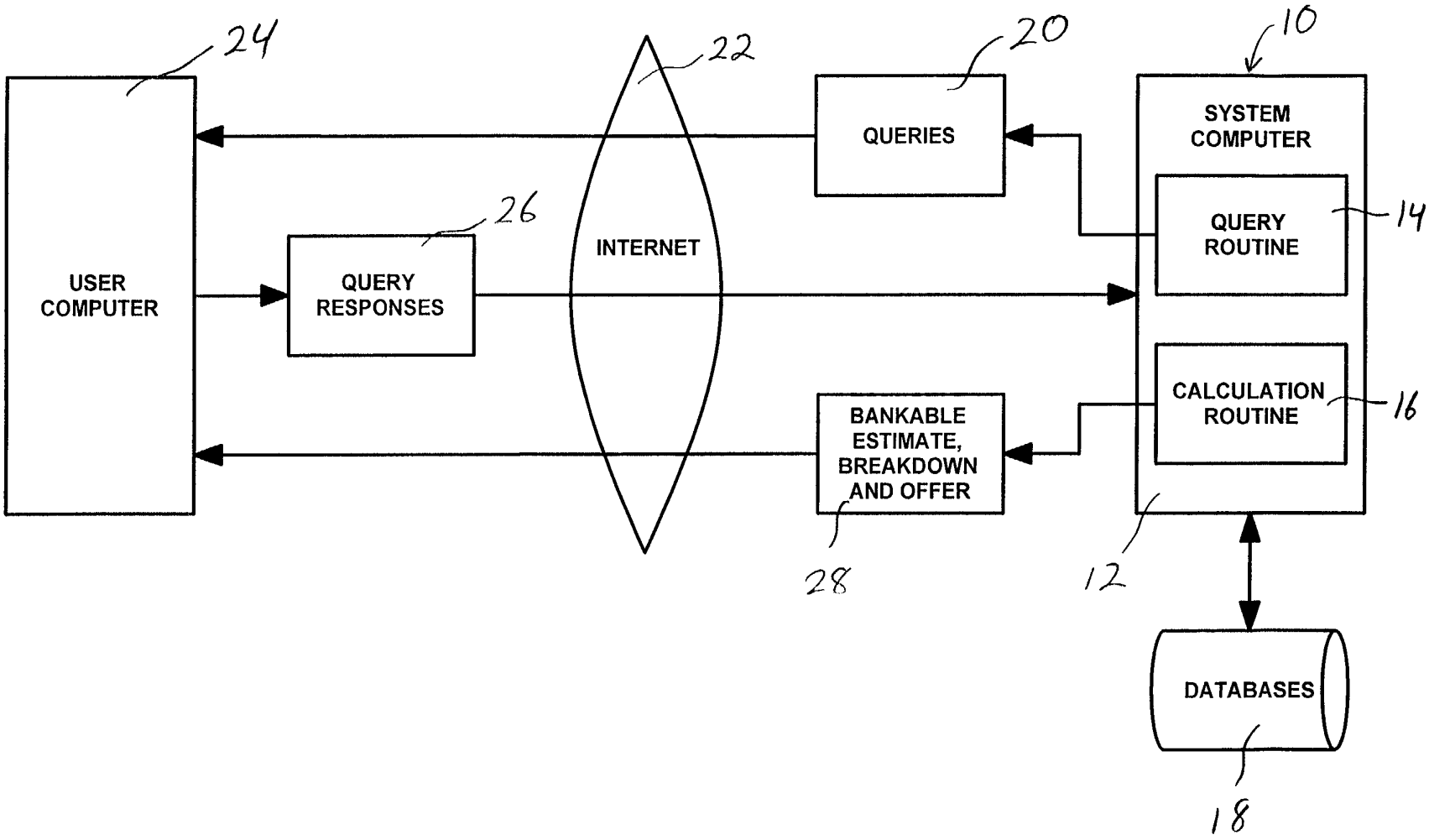

FIG. 1

002020 "1592660

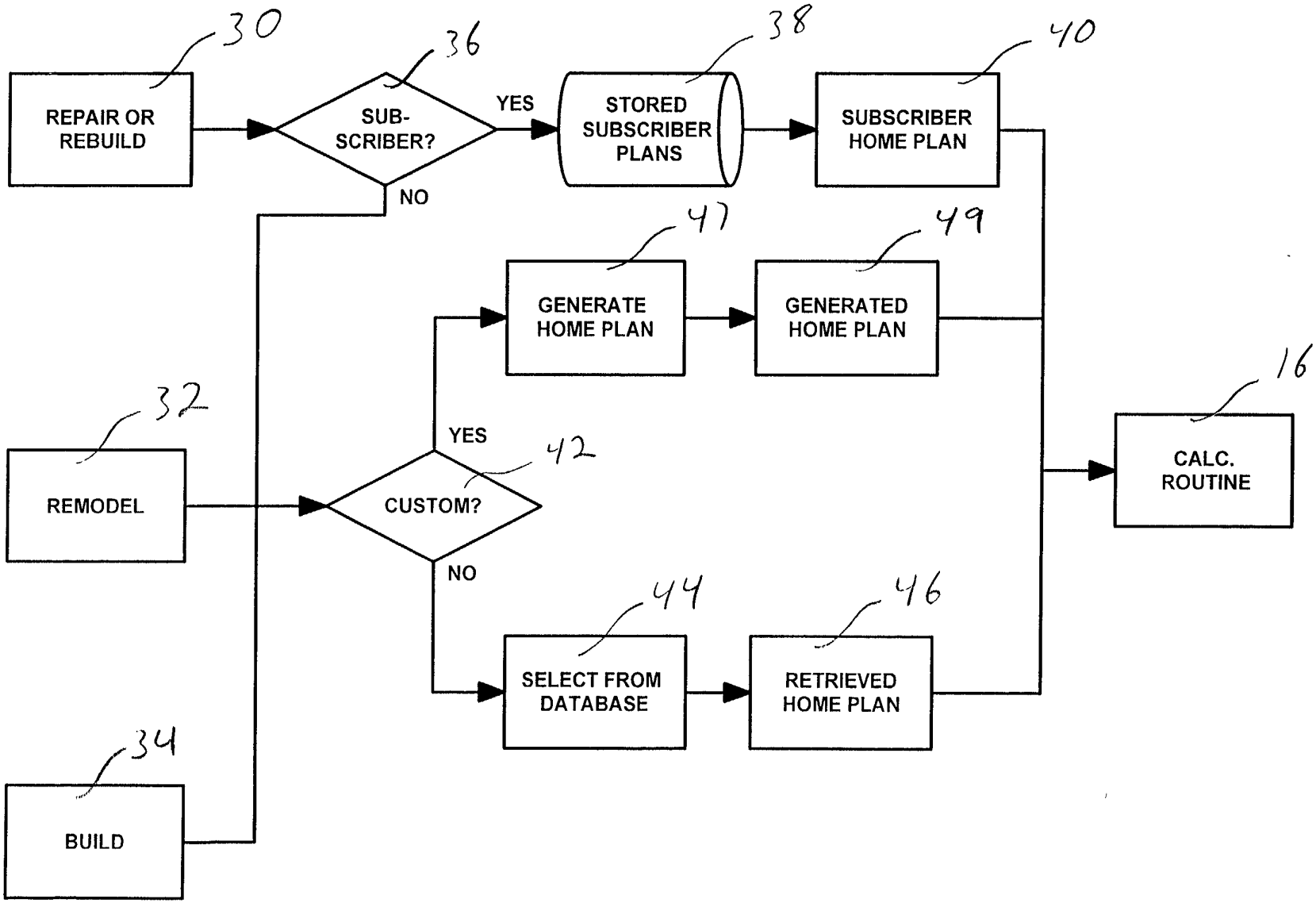

FIG. 2

09497564060

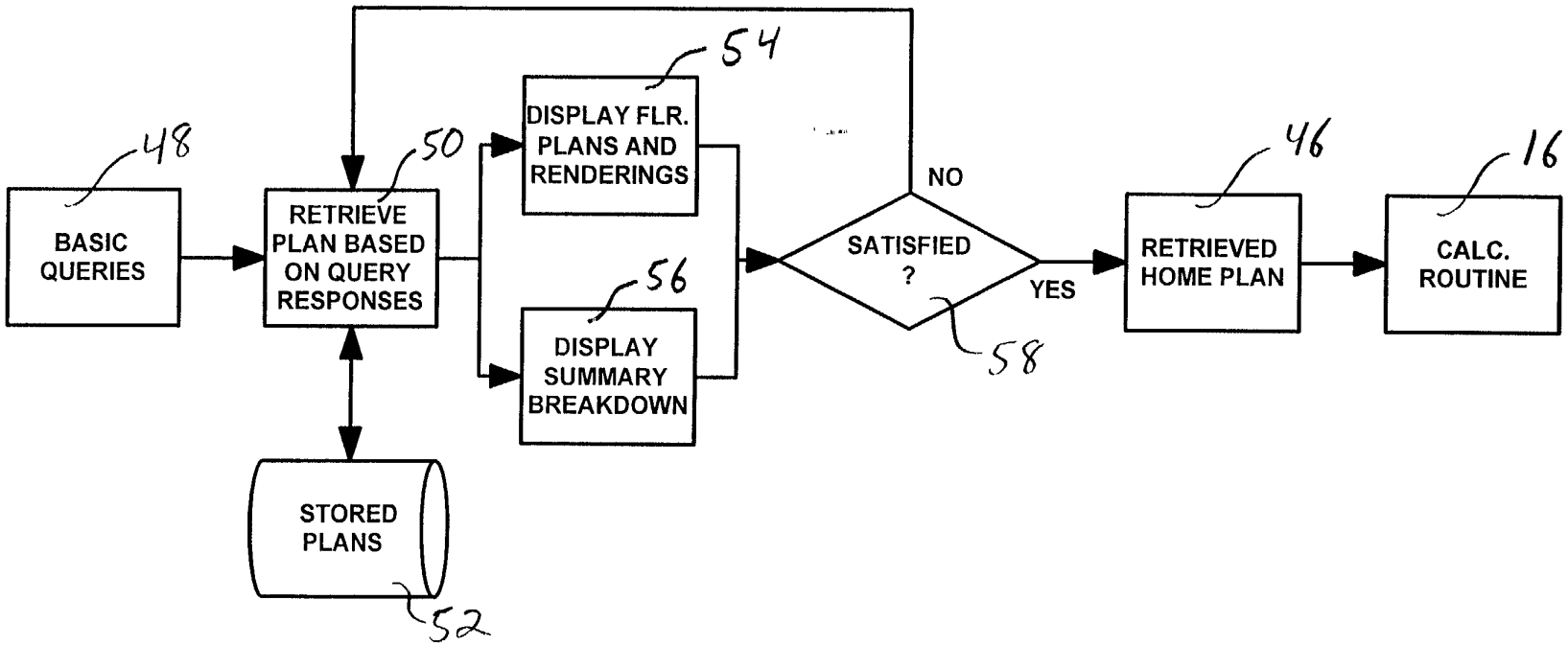

FIG. 3

002020-1552680

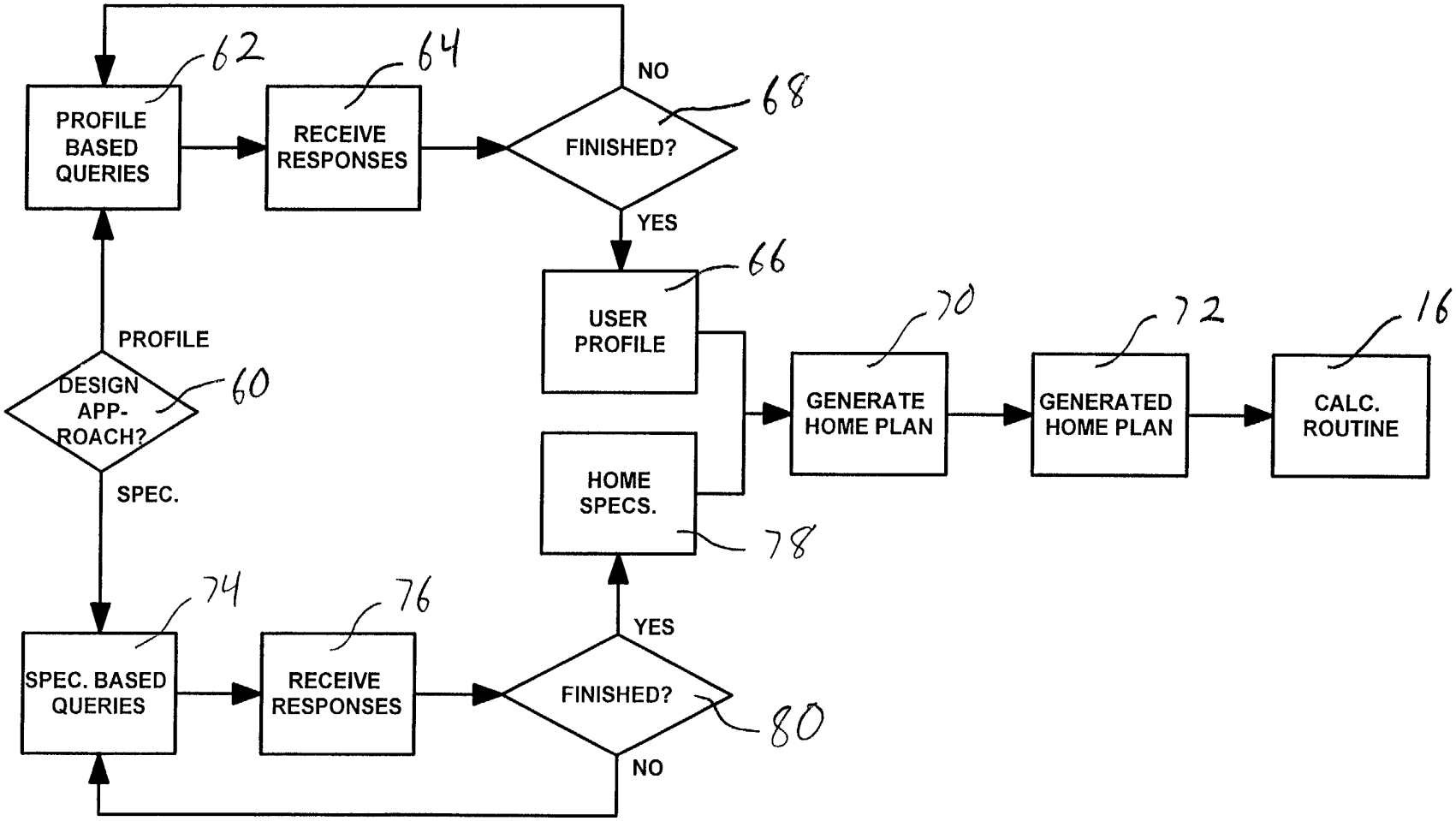

FIG. 4

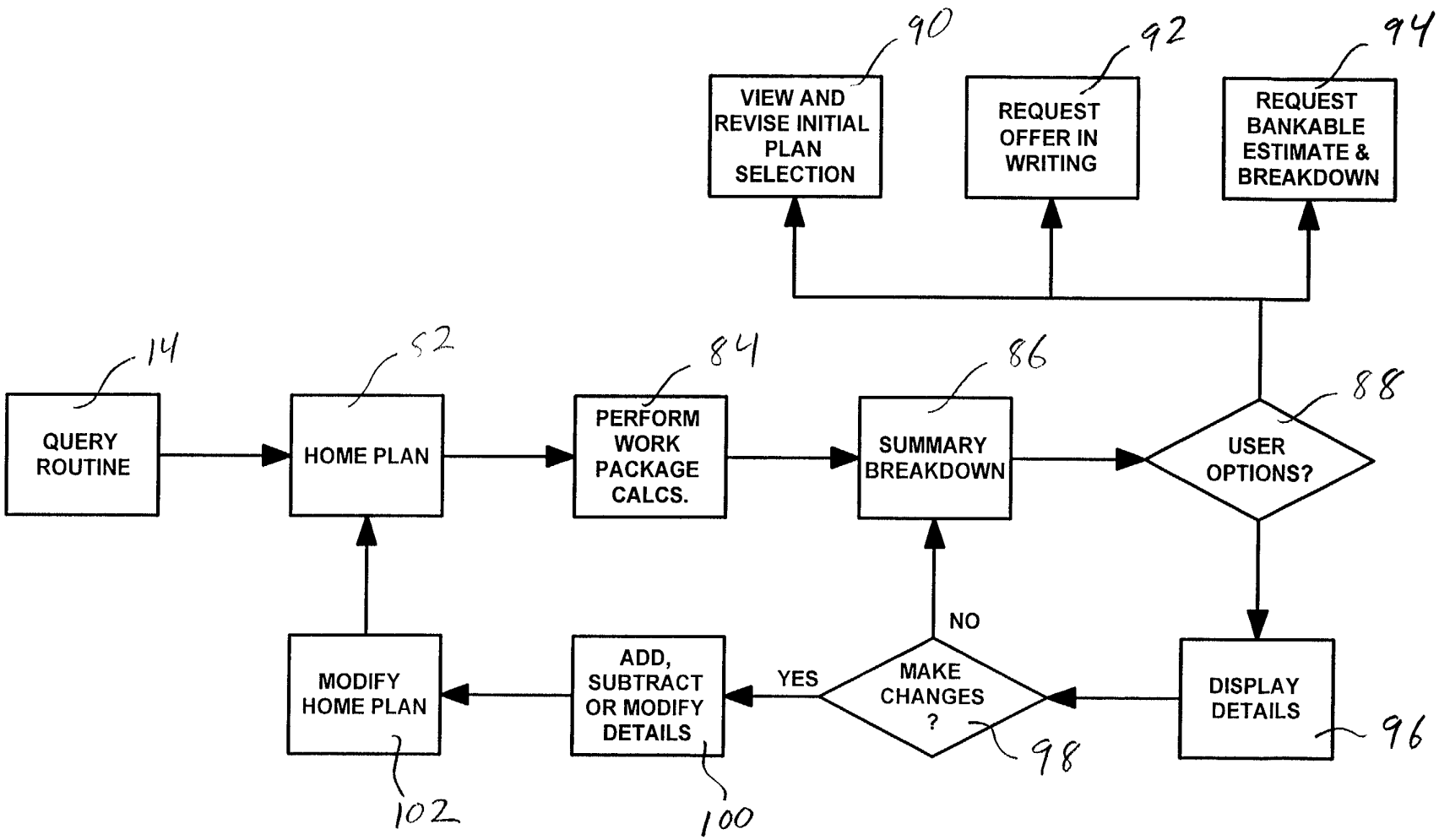
VIEW AND REVISE INITIAL PLAN SELECTION
REQUEST OFFER IN WRITING
REQUEST BANKABLE ESTIMATE & BREAKDOWN
90
92
94
QUERY ROUTINE
HOME PLAN
PERFORM WORK PACKAGE CALCS.
SUMMARY BREAKDOWN
USER OPTIONS?
14
52
84
86
88
NO
MODIFY HOME PLAN
ADD, SUBTRACT OR MODIFY DETAILS
YES
MAKE CHANGES ?
DISPLAY DETAILS
96
98
102
100

FIG. 5

006020 "1995261160

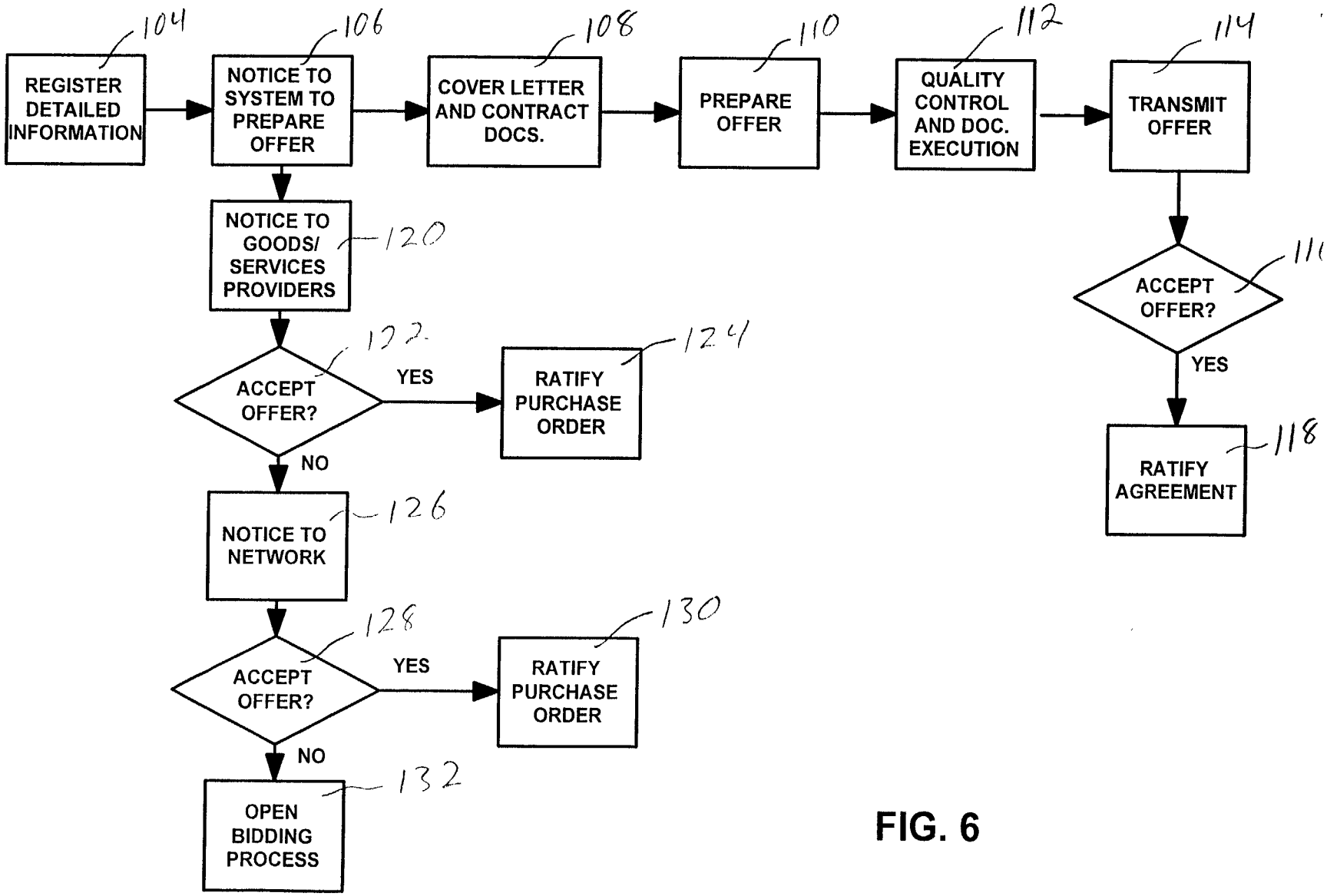

FIG. 6

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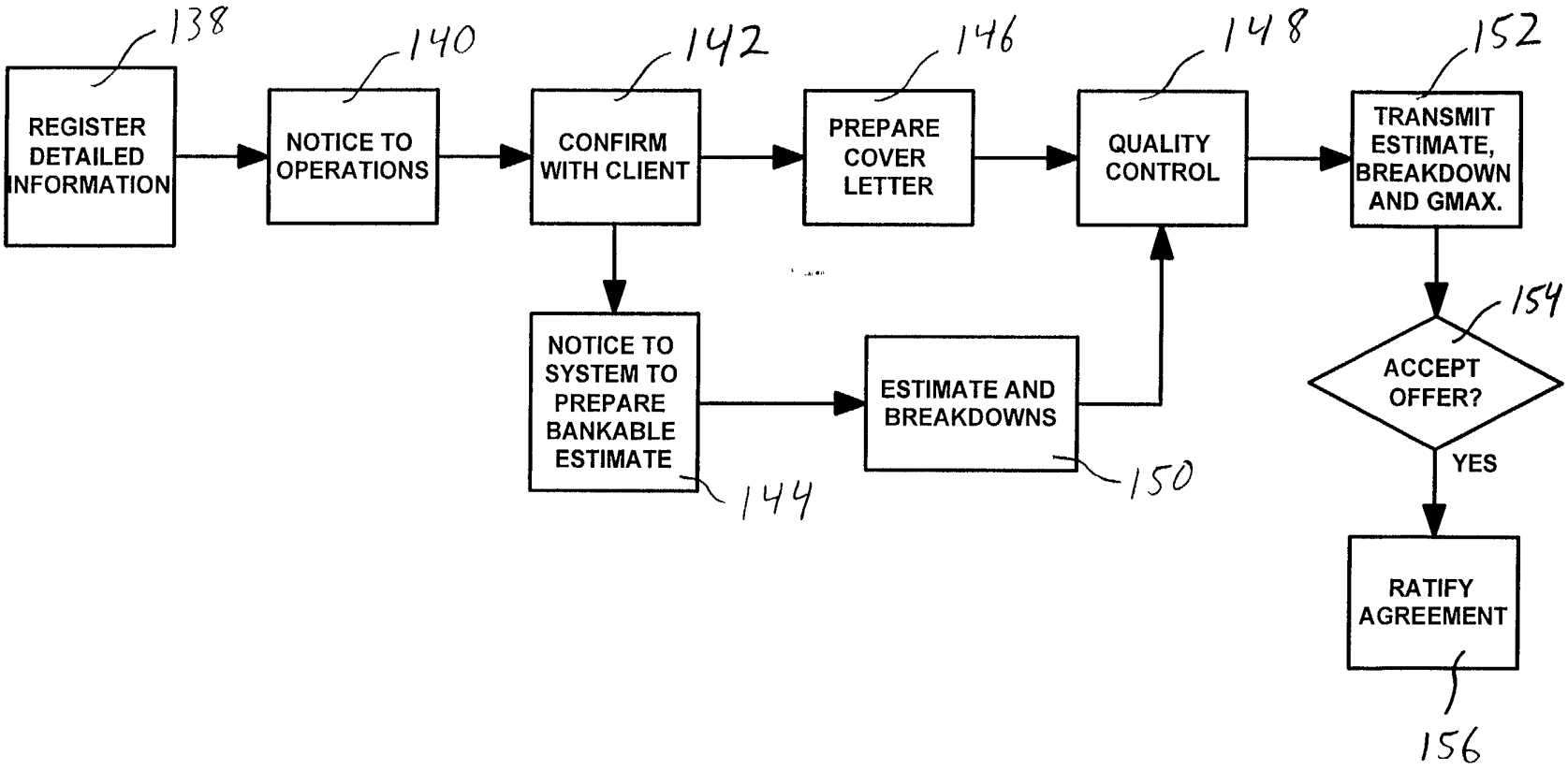

FIG. 7

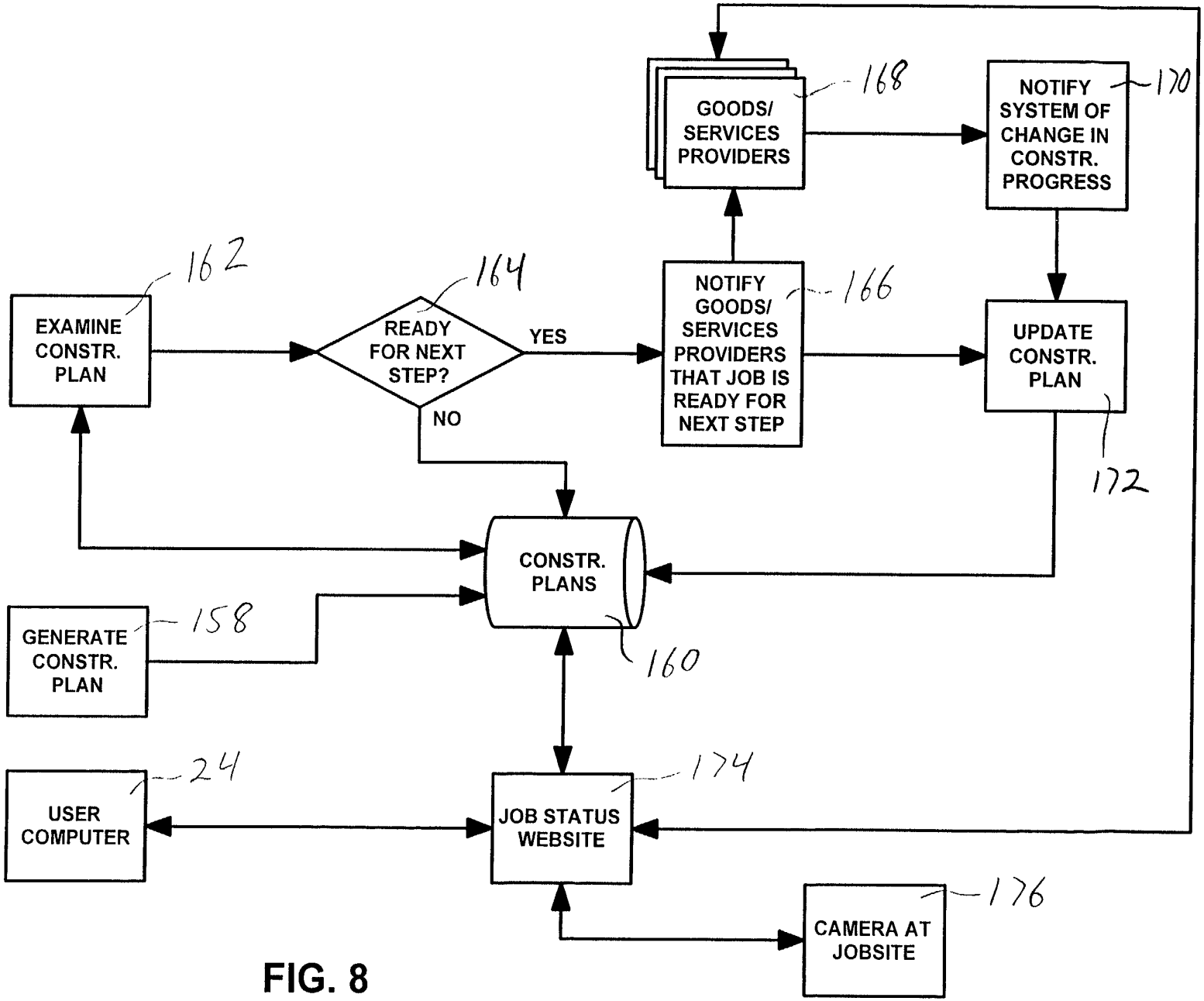
GOODS/ SERVICES PROVIDERS
168
NOTIFY SYSTEM OF CHANGE IN CONSTR. PROGRESS
170
EXAMINE CONSTR. PLAN
162
READY FOR NEXT STEP?
164
YES
NO
NOTIFY GOODS/ SERVICES PROVIDERS THAT JOB IS READY FOR NEXT STEP
166
UPDATE CONSTR. PLAN
172
CONSTR. PLANS
160
GENERATE CONSTR. PLAN
158
USER COMPUTER
24
JOB STATUS WEBSITE
174
CAMERA AT JOBSITE
176

FIG. 8

002020 "1552681160

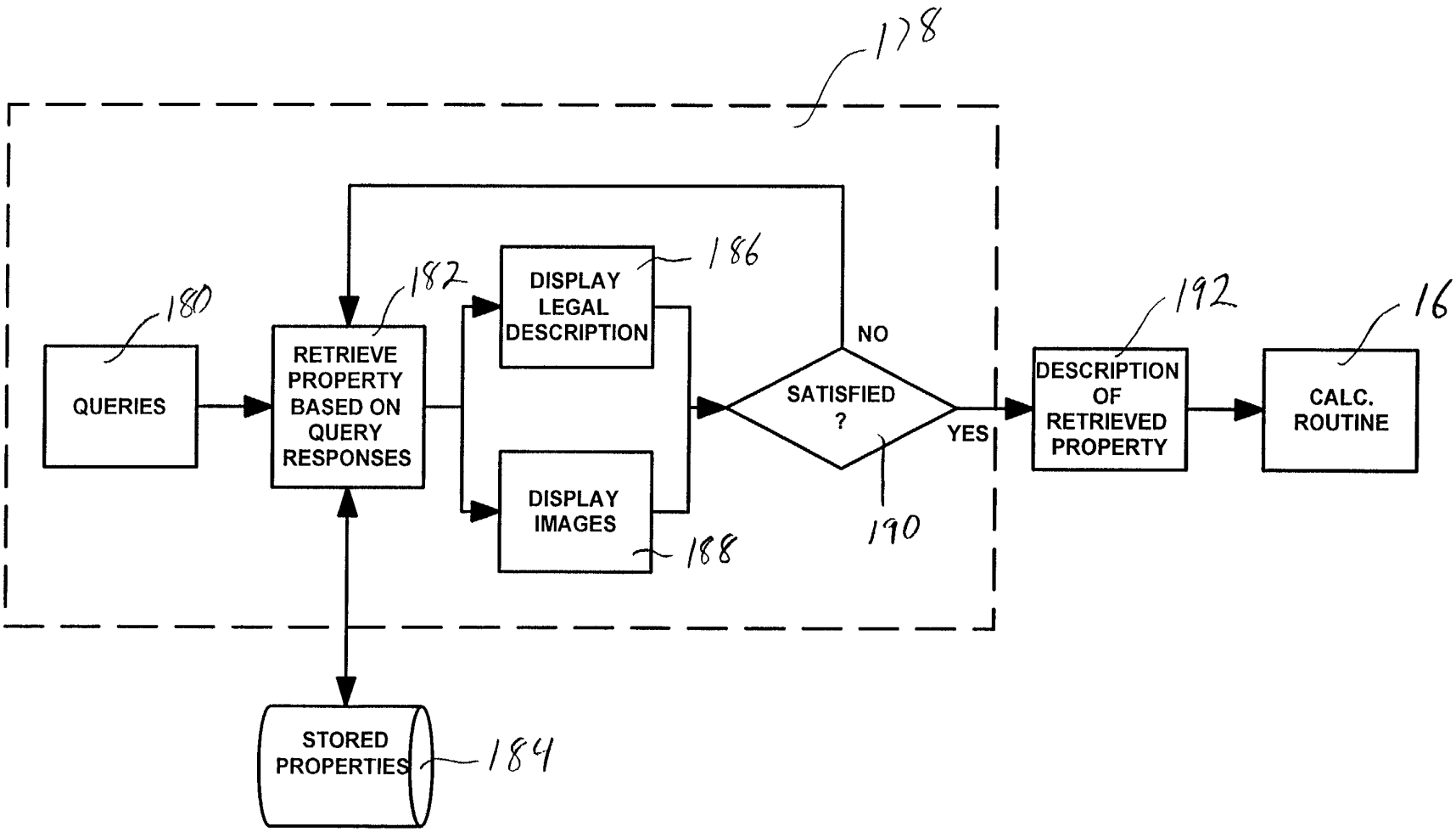

FIG. 9

09497551 020200

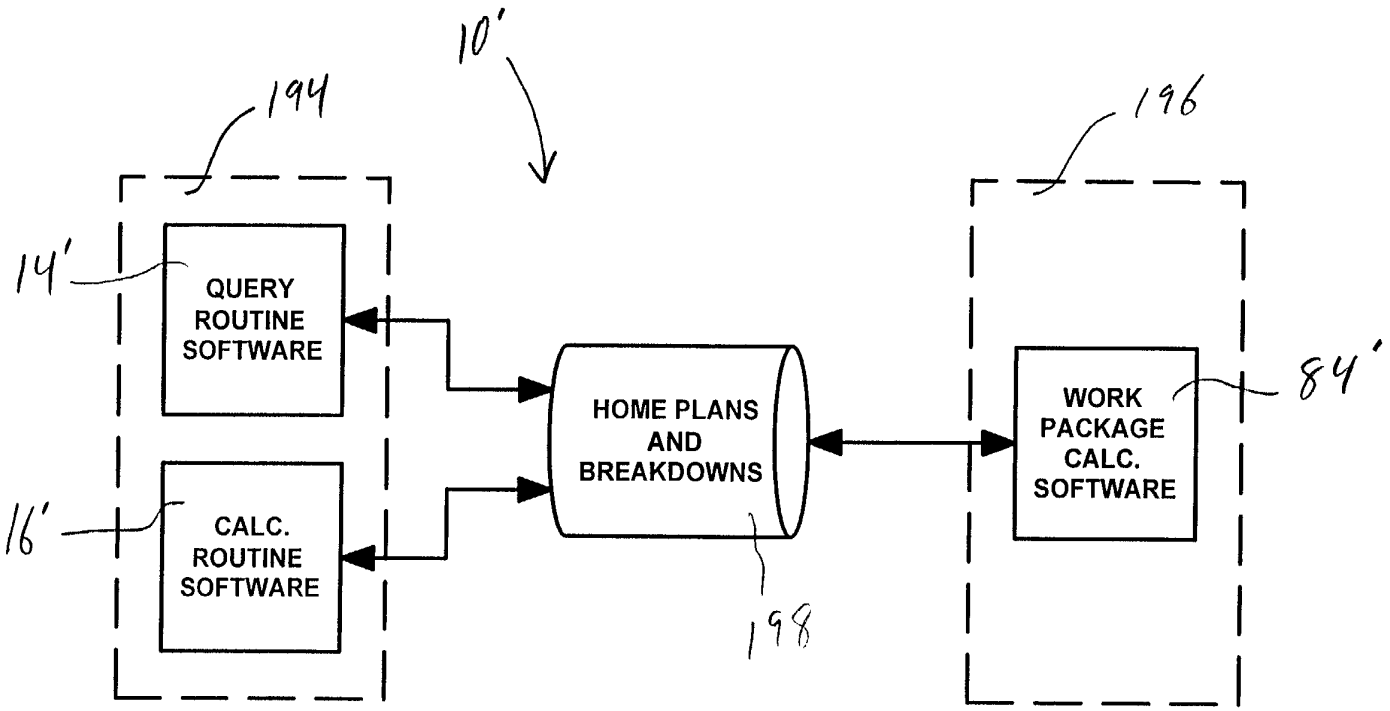

FIG. 10

Declaration and Power of Attorney

As below-named inventors, we hereby declare that:

Our residences, post office addresses, and citizenships are as stated below next to our names.

We believe that we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled **System For Automating And Improving Home Design And Construction**.

We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. To the best of our knowledge, information, and belief the facts stated therein are true.

We acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

We hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign applications for patent or inventor's certificate listed below and have also identified below any foreign applications for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

None

We hereby claim the benefit under Title 35, United States Code, §120 of the following United States Applications listed below, and insofar as the subject matter of each of the claims of this Application is not disclosed in the prior United States Application in the manner provided by the first paragraph of Title 35, United States Code, §112, we acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

None

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false

statements may jeopardize the validity of the application or any patent issued thereon.

We hereby appoint Wesley W. Whitmyer, Jr., Registration No. 33,558, and Todd M. Oberdick, Registration No. 44,268, of ST.ONGE STEWARD JOHNSTON & REENS LLC; 986 Bedford Street; Stamford, Connecticut 06905-5619 (203 324-6155); with full power of substitution, association and revocation, as attorney to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Please direct all telephone calls and correspondence to Wesley W. Whitmyer, Jr. at the above address and telephone number.

Full name of first inventor:	**Cory Attra**
Inventor's signature	
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Residence:	Weston, CT
Citizenship:	A citizen of the United States
Post Office Address:	17 Lords Highway Weston, CT 06883
Full name of second inventor:	**Marc Pritchard**
Inventor's signature	
Date:	Jan 30 /00
Residence:	Antioch, CA
Citizenship:	A citizen of the United States
Post Office Address:	4738 Cache Peak Drive Antioch, CA 94509

Docket: 4756.0